

REMARKS

Claims 1-4, 10 and 14-16 are pending in this application. By this Amendment, claim 1 is amended. Support for the amendment to the claim can be found, for example, in the Examples and Tables 1-4 of the instant specification. No new matter is added.

Entry of the amendments is proper under 37 CFR §1.116 because the amendments: (a) place the application in condition for allowance (for the reasons discussed herein); (b) do not raise any new issue requiring further search and/or consideration as the amendments amplify issues previously discussed throughout prosecution; (c) satisfy a requirement of form asserted in the previous Office Action; (d) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (e) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

In view of the foregoing amendments and following remarks, reconsideration and allowance of the application are respectfully requested.

I. Rejection Under 35 U.S.C. §102/§103

The Office Action rejects claims 1-4, 10 and 14-16 under 35 U.S.C. §102(e) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over U.S. Patent Application Publication No. 2002/0192552 to Lampe-Onnerud et al. ("Lampe-Onnerud"). Applicants respectfully traverse the rejection.

By this Amendment, claim 1 recites, "A positive electrode material powder for a lithium secondary battery containing a Li-Ni-Co-Ba-O system component as a main component, wherein each particle which constitutes the powder has an amorphous phase of an oxide; wherein the amount of Ba in the system component is 0.0005 to 0.007 mol ratio; wherein the amorphous phase of the oxide contains at least one element selected from the

group consisting of Na, K, Si, P and Al; and wherein the amount of the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0."

The Office Action asserts that Lampe-Onnerud discloses a material for use as a cathode material in a lithium battery where the coating, and optionally the core of the material, can be a material having a formula of $\text{Li}_{x1}\text{A}_{x2}\text{Ni}_{1-y1-z1}\text{Co}_{y1}\text{B}_{z1}\text{O}_a$ wherein $x2$ and $z1$ each is greater than about 0 and equal to or less than 0.2, "A" can be selected to be Ba, and "B" can be selected to be Al. However, Lampe-Onnerud fails to teach or suggest each and every feature of amended claim 1.

Claim 1 is directed to an electrode material powder where each particle of the powder has an amorphous phase of an oxide in a range from 0 to 0.01 mol ratio. Lampe-Onnerud fails to teach or suggest that the cathode material consists of any amorphous material, let alone the specific mol ratio as recited in amended claim 1. Further, Lampe-Onnerud discloses at paragraph [0056] that the anode contains an amorphous carbon. Thus Lampe-Onnerud distinctly discloses that an amorphous material is present at the anode in a material entirely different from the above formula, but deliberately omits that an amorphous material is present at the cathode. Therefore, Lampe-Onnerud fails to teach or suggest this feature of amended claim 1.

Additionally, Lampe-Onnerud discloses an extremely wide range for $x2$ and $z1$ (from 0 to 0.2). These wide ranges fail to recognize the benefits of the narrow ranges recited in claim 1 (from 0.0005 to 0.007 and from 0 to 0.01, respectively). The effects of the claimed ranges, as opposed to the broader ranges disclosed by Lampe-Onnerud, can be seen in Tables 2 and 4 of the instant specification. Further, the Office Action asserts that Examples 6-15 of the Lampe-Onnerud reference disclose the claimed ranges or disclose the claimed ranges with "sufficient specificity." Applicants respectfully disagree.

Claims 6-11 of Lampe-Onnerud disclose that Mg, not Ba, is present as component "A" in the above formula in a mol amount of 0.01. Applicants assert that even though Lampe-Onnerud discloses that component "A" can be chosen from a group that consists of Mg and Ba, this does not teach or suggest that if Ba were used in place of Mg in the Lampe-Onnerud's examples, the same amount of Ba would be required to obtain the properties of the compound with the disclosed amount of Mg. Put differently, if one were to substitute Ba for Mg in Examples 6-11 of Lampe-Onnerud, a higher mol amount of Ba, but within the disclosed range of from 0 to 0.2, may be required to obtain the same properties as the disclosed amount of Mg. Additionally, the mol amount of Mg disclosed in Examples 6-11 of Lampe-Onnerud (0.01) is above the maximum mol amount of Ba as claimed in amended claim 1 (0.007). Also, Examples 6-15 of Lampe-Onnerud disclose that component "B" of the above formula can be Mn in mol amounts of 0.03 and 0.05. However, as argued above, if Al is substituted in these Examples for Mn, a different mol amount of Al, but still within the disclosed range of from 0 to 0.2, may be required to achieve the same properties as the disclosed amounts of Mn. Further, both of these mol amounts of Mn disclosed in the Lampe-Onnerud examples (0.03 and 0.05) are above the maximum mol amount of Al in the claimed range (0.01). Thus, Lampe-Onnerud fails to teach or suggest these features of amended claim 1.

Nowhere does Lampe-Onnerud provide any reason or rationale that would have led one of ordinary skill in the art to modify the teachings of Lampe-Onnerud to practice the claimed invention. While Lampe-Onnerud broadly discloses the ranges of x1 and z1 to be from 0 to 0.2, and exemplifies values of 0.01 and 0.03, respectively, at the lowest, Lampe-Onnerud does not teach that the mol amount should be in the range of 0 to 0.007 and 0 to 0.01, respectively, as presently claimed. It would not have been obvious to one of

ordinary skill in the art to have modified the mol amounts Lampe-Onnerud to the specifically claimed ranges to produce an electrode powder material as claimed.

Lampe-Onnerud does not anticipate, and would not have rendered obvious claim 1. Claims 10 and 14-16 variously depend from claim 1 and, thus, also are not anticipated by and would not have been rendered obvious by Lampe-Onnerud. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

II. Rejections Under 35 U.S.C §103

A. EP '817 in view of the AAPA

The Office Action rejects claims 1-4, 10 and 14-16 under 35 U.S.C. §103(a) over EP 0849817 (EP '817) in view of the Applicants alleged admission of prior art ("the AAPA"). Applicants respectfully traverse the rejection.

The Office Action asserts that EP '817 discloses a lithium containing amorphous nickel oxide with a formula of $\text{Li}_x\text{Ni}_{1-y}\text{Co}_y\text{M}_z\text{O}_2$ where "M" is selected from the group consisting of Al, Si or P. However, the Office Action acknowledges that EP '817 does not disclose the Ba component or the specific amount of the amorphous phase. Thus, the Office Action combines the disclosure of the AAPA with the disclosure of EP '817 to address the discrepancies of EP '817 as to claim 1. However, EP '817 and the AAPA, individually or in combination, fail to teach or suggest each and every feature of amended claim 1.

Claim 1 is directed to an electrode material with Ba in an amount from 0.0005 to 0.007 mol ratio and an amorphous phase oxide in an amount from 0 to 0.01 mol ratio. However, EP '817 teaches a lithium-containing amorphous nickel oxide that is represented by the chemical composition of formula $\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}_z\text{O}_2$, wherein M is at least one of Mn, Al, P, B and S, and z is greater than 0 and less than 1. See EP '817 at page 3, line 56 - page 4, line 6. This disclosed range is substantially larger than the claimed range, and does not yield the results as those obtained from the claimed invention, as is shown in Tables 2 and 4.

Further, in the examples of EP '817, there is no disclosure of an "M" component used in conjunction with Co, and thus there is no disclosure in EP '817 as to the beneficial effects of an amorphous oxide layer containing at least one of Na, K, Si, P and Al with a main component of Li-Ni-Co-Ba-O as recited. Therefore, EP '817 provides no reason or rationale for one of ordinary skill in the art to have modified the wide range of the amorphous phase disclosed EP '817 to include the narrow mol ratio of amorphous oxide phase as claimed.

Further, the AAPA does not address the discrepancies of EP '817. The Office Action does not apply the AAPA to address the claimed mol ratio of the amorphous phase, because the AAPA fails to teach or suggest the presence of an amorphous phase. Thus, EP '817 and the AAPA fail to teach or suggest this feature of amended claim 1.

The Office Action applies the AAPA to disclose the presence of Ba in an amount from 0 to 0.10 mol ratio. See Office Action, page 7, second full paragraph. However, the amount of Ba disclosed in the AAPA is a much larger range than the claimed mol ratio of Ba (from 0.0005 to 0.007). This narrow range of Ba was discovered by the Applicants to optimize the discharge capacity when combined with an amorphous phase oxide as claimed. Thus, it would not have been obvious to one of ordinary skill in the art to have chosen the narrow mol ratio of Ba as claimed from the wide range disclosed by the AAPA, because the AAPA does not disclose the use of an amorphous oxide phase. Additionally, EP '817 provides no motivation for one of ordinary skill in the art to have chosen the narrow Ba range as claimed, because EP '817 does not teach or suggest that an amorphous oxide phase, which contains at least one of Na, K, Si, P and Al, should be combined with Ba. Therefore, it would not have been obvious to one of ordinary skill in the art to combine the narrow mol ratio of the amorphous phase of the oxide as claimed with the narrow mol ratio of the Ba as claimed.

Furthermore, The Office Action attempts to use the Applicants' own disclosure as motivation to combine the applied references. Thus, the Office Action impermissibly uses

Applicants' disclosure as a road map for combining the references and finding obviousness. Specifically, Applicants' disclosure that a constituent component of the amorphous phase of the oxide in the present invention is composed of an oxide of one or a plurality of elements selected from the group consisting of Na, K, Si, P and Al, which allows easy formation of the amorphous phase of the oxide, is part of Applicants' own disclosure. The use of this disclosure to conclude that it would have been obvious to combine the AAPA and EP '817 is an impermissible use of the Applicants' disclosure. Also, citing to the Applicants' own comparative examples further exemplifies the Office Action's impermissible use of hindsight. See Office Action, page 7, fourth paragraph. The comparative examples are used by the Applicants to demonstrate the effects of the claimed invention as compared to a similar compounds that are slightly outside of the claimed scope. Using Applicants' comparative example as prior art is impermissible use of the Applicants' disclosure. Therefore, the Office Action's use of Applicants' disclosure to provide a reason or rationale for why one of ordinary skill in the art would recognize that it would improve similar materials or products in the same way by using known techniques is an improper combination based upon a hindsight analysis. Accordingly, claim 1 would not have been obvious over EP '817 in view of the AAPA.

Claim 1 would not have been rendered obvious by EP '817 and the AAPA. Claims 2-4, 10 and 14-16 depend from claim 1 and, thus, also would not have been rendered obvious by EP '817 and the AAPA. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

B. JP '277 in view of the AAPA

The Office Action rejects claims 1-4, 10 and 14-16 under 35 U.S.C. §103(a) over JP 06-275277 (JP '277) in view of the Applicants alleged admission of prior art ("the AAPA"). Applicants respectfully traverse the rejection.

The Office Action asserts that JP '277 discloses a positive electrode composition comprising at least Li, Co, Ni, P in oxide forms, and that the mol ratio of P in the oxide is at least 0.2 mol. See Office Action page 10, second full paragraph. However, the claimed mol ratio of the amorphous phase of the oxide is from 0 to 0.01. The Office Action asserts that prima facie obviousness "exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties." Office Action, page 14, first paragraph. However, the Office Action gives no reason or rationale why one of ordinary skill in the art would have expected a range of "at least 0.2 mol" would have the same properties as mol ratio of from 0 to 0.01. The difference between the maximum of the claimed range and the minimum of the disclosed range is at least an order of magnitude. Applicants assert that if the amount of the amorphous phase oxide exceeds 0.01 mol ratio, the discharge capacity is decreased, as disclosed on page 9 of the original specification. Therefore, a mol ration of at least 0.2 would have a dramatically reduced discharge capacity over the claimed range. Additionally, JP '277 does not disclose that Ba is present in the composition. Thus, JP '277 fails to teach or suggest each and every feature of amended claim 1.

Further, for at least the reasons discussed above in the argument over the EP '817 reference, JP '277 and the AAPA fail to provide a reason or rationale to modify the disclosure of JP '277 to yield the claimed mol ratios of the amorphous phase oxide and Ba. Namely, the APPA does not teach or suggest an amorphous phase oxide so they provide no reason or rationale to modify the amorphous phase as disclosed in JP '277 to be within the claimed ratios, and the AAPA provides no reason or rationale, other than that disclosed in Applicants' own disclosure, to modify the disclosure of JP '277 to include the claimed amount of Ba.

Claim 1 would not have been rendered obvious by JP '277 and the AAPA. Claims 2-4, 10 and 14-16 depend from claim 1 and, thus, also would not have been rendered obvious

by JP '277 and the AAPA. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Nicolas A. Brentlinger
Registration No. 62,211

JAO:NAB/kjl

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OLIFF & BERRIDGE, PLC
P.O. Box 320850
Alexandria, Virginia 22320-4850
Telephone: (703) 836-6400

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